A Study of the Isotopic Uranium Abundance Ratios for Select California Groundwater

Carolyn T. Wong, Howard S. Okamoto, Alexis M. Milea, P.E.
S. Kusum Perera, Ph.D., Frank J. Baumann, P.E.

State of California, Department of Health Services
2151 Berkeley Way, Room 119
Berkeley, CA 94704

Abstract

Previous studies indicated the presence of elevated levels of uranium in groundwater of some Rocky mountain states and certain parts of California. Additional studies indicated that the isotopic abundance ratios for uranium-238 and uranium-234 in groundwater may vary significantly from that of the crustal abundance. Representative samples from 102 groundwater locations throughout California were analyzed for gross alpha, total uranium by laser phosphorimetry and total uranium by inductively coupled plasma-mass spectrometry. Selected samples were analyzed for isotopic abundances of uranium-234, uranium-235 and uranium-238 by alpha spectroscopy. Data comparing the above methods for total uranium will be presented. Isotopic uranium abundance ratios for the selected samples will be presented along with applicable activity to total mass conversion factors. Implications of the activity to mass conversion factor with respect to the existing California Maximum Contaminate Level and the proposed Federal Maximum Contaminate Level in drinking water will be discussed.